



JO SCULTHROP

SELENIUM

Element Symbol: **Se**

Atomic Number: **34**

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International Year of
CHEMISTRY
2011



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Selenium was named after Selene, the moon goddess of Greek mythology, by its Swedish discoverer Jöns Jacobs Berzelius, who found the element associated with “the earth element” tellurium in 1817. The element has several allotropes including a grey crystalline hexagonal selenium, a red crystalline form, an amorphous (which has a disordered atomic structure) red powder, and a black vitreous (glass-like) form. Selenium is a rare component of the Earth’s crust (about 0.000005%) that is mostly found as selenide associated with heavy metal sulfide ores, such as copper and lead sulfides. Free selenium is extracted from the selenides obtained as a by-product of refining the sulfide ores. Amorphous selenium is a photoconductor (a light-dependent semiconductor) and it has had a long history of use in light-based applications - it was used to make the first solar cell in 1883. In the past, light meters on cameras were made from amorphous selenium and photocopiers used amorphous selenium as an essential component in the xerography process. While the use of selenium in cameras and photocopiers has been superseded, the element is still used as a photoconductor in xeroradiography (where medical X-rays are recorded on paper) and in capturing digital X-rays. In keeping with its historic use in the first solar cell, selenium is often used as a component of thin-film solar cells.

A further industrial use of selenium is in glass manufacturing. Glass makers use selenium to produce yellow and red glass and to negate the green tint in glass containing iron impurities.

The most important role selenium plays in our lives is in our body, which contains about 15 milligrams of selenium. The element was considered toxic until the 1950s when it was realised that it was an essential trace element for humans and other animals. Since the first selenium-containing protein was isolated in the 1970s, 25 selenoproteins have been discovered in humans. Several of these proteins have been identified as antioxidants, although the functions of many selenoproteins are still unknown. It is known, however, that both too much and too little selenium can have a negative effect on your health.

Selenium has also been extremely useful in determining the structure of proteins, which is a fundamental part of biomedical research. The incorporation of selenium in proteins has enabled the determination of the structure of many proteins by X-ray crystallography.

Provided by the element sponsor sponsor Hugh Harris

ARTISTS DESCRIPTION

I investigated the area of food science to formulate my image for the element Selenium. Selenium plays a key role in the functioning of the human immune system and thyroid gland. The trace element is also needed for successful reproduction. We have naturally occurring selenium in our bodies and it is also available in a number of our foods. A selenium rich source of food is the Brazil nut. I have portrayed this orbicular hard shelled fruit containing the triangular, wrinkled seeds known as Brazil nuts.

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